TECHNICAL SPECIFICATION FOR 11KV 200AMPS SINGLE BREAK GROUP OPERATION SWITCHES

1.0 **Scope**:

This specification covers the manufacture, testing at manufacturer's works and supply of 11KV Group operating switches of single break 200 Amps. Capacity complete with accessories, such as operating pipe, connecting pipe guides, supporting insulators, link work and locking arrangement, etc., complete conforming to IS-9921(Part 1 to 5) and the enclosed typical drawings.

2.0 **A) Weather Conditions**:

The switches supplied shall be suitable for satisfactory continuous operation under weather conditions as specified below:

- Maximum ambient temperature : 50ºC
- Minimum ambient temperature : -5º C
- Relative humidity : 0 to 100%
- Average annual rainfall : ≤1000 mm
- Max. Altitude above mean see level : ≤1000 m (3300Ft)
- Isoceraunic level (Max) : ≤50 Days
- Seismic level : 0.25 g
- Max. wind speed : ≤ 39 m/s

B. SYSTEM PARAMETERS

The arresters must be able to operate under the system parameters mentioned in this specification:

Sl.No.	Particulars	Values
1	Nominal system voltage	11kV rms
2	Frequency	50Hz
3	Grounding of neutral	Solidly earthed
4	Temporary over voltage	9.8 kV rms for 10sec.
5	Highest system voltage	12kV rms
6	Short circuit level	16kA rms
7	BIL of equipment to be protected	75 kV peak

3.0 STANDARDS

The equipment offered shall conform to IS–9921 and latest amendments thereof. The switches shall be suitable for horizontal upright mounting.

4.0 **CONSTRUCTION**:

4.1 The base shall be made of robust rolled M.S. channel section of size 75x40x4.8 mm. All ferrous parts shall be hot dip galvanized and all copper parts shall be tinned. The rotating parts shall be fitted with suitable bearing.

4.2 The blades and contacts shall be made of best quality electrolytic copper and shall be capable of carrying the rated current without exceeding the temperature limits specified in table-4 of IS-9921

(part-II).

4.3 The insulators shall be of post type, brown glazed porcelain pedestal post type design E.22 as per ISS:5350 (Part-III)/1971 with cap screws and spring washers and to technical specification enclosed conforming to IS:2544-1973 with amendments thereof.

4.4 The operating pipe shall consist of Tandem pipe (spindle rod) of length 2000 mm and the vertical pipe of length 5400 mm. The pipe shall be 25NB outer diameter of 32mm min "B" type class (i.e., Medium class) G.I. Pipe. The G.I. Pipe used shall conform to IS-1239-Part-I-1979 and amendments thereof. A guide shall be provided to the vertical operating pipe an intermediate position to arrest its lateral movement. Necessary fixing arrangements of the guide to the pole should also be supplied.

4.5 The Tenderer shall clearly indicate in the tender, the Brand name of the insulators used in manufacture of 200 Amps Single Break GOS along with relevant type test reports failing which, the offer will not be considered. The successful bidder should get the insulator make approved by BESCOM, before making supplies.

4.6 Bimetallic/P.G.Clamps suitable for terminating Weasel/Rabbit ACSR Conductor shall be provided.

4.7 All the iron parts shall be hot dip galvanized and shall conform to the relevant IS specifications with latest amendments those of:-

4.8 **Arcing Horns**: The switches shall be supplied with hot dip galvanized arcing horns so that while closing or opening the switches, arcing takes place between the arcing horns and not between the main contacts.

4.9 **Locking Arrangements**: Suitable locking arrangements shall be provided for the operating handle. The locking device forms part of this tender and shall be supplied with duplicate keys along with the switches.

4.10 The switches shall be designed to withstand the test voltage as per IS:9921 or its latest revision thereof. The switches shall be designed to have the following current ratings.

Continuous current carrying capacity	
Without over heating	: 200A
1 Seconds rating	: 6.6 KA
Rates peak withstand current	: 16.8 KA

5.0 **Test and Test Certificate**:

5.1 **Routine Tests**: The Routine test as per IS:9921 shall be conducted on each G.O.S in the present BESCOM representations and certificate shall be submitted duly signed by a responsible officer of the tenderers/organization before dispatch of consignment.

5.2 BESCOM reserves the right to get the type test conducted as per IS: 9921 on a selected G.O.S. in the presence of BESCOM's testing staff at the cost of the supplier.

1) Impulse Voltage dry test
2) Power frequency voltage dry test
3) Power frequency voltage wet test

4) Temperature rise test
5) Measurement of resistance
6) Test for rated peak short circuit current
7) Operation test
8) Mechanical endurance test

5.3 **Packing**: The group operating switches shall be securely packed to withstand rough handling during the transit and storage.

5.4 **Name Plate**: The group operating switch shall be provided with the name plate legibly and indelibly marked with the following information:

1) Name of materials
2) Name of the manufacturer/Trade mark
3) Letters (BESCOM)
4) Purchase order No. and Date
5) Type-designation and Sl. No.
6) Rated voltage
7) Rated current
8) IS specification

BILL OF MATERIALS FOR 200A SINGLE BREAK GOS

Sl. No.	Description	Section in mm/ Length in mm	Size	Qty. in
1	MS Base Channel	75 x 40 x 4.8	500mm	3 Nos.
2	Gun metal Bushes (Top & Bottom) for spindle	25mm Ø	6mm Ht	6 Nos.
3	Spindle Plate with spindle	75x5 mm	280mm	3 Nos.
4	11kV Post Insulator	-	-	6 Nos
5	Top Plate	50x5mm	100mm	3 Nos.
6	Contact Box (Bottom)	32mm W 8mm H	110mm L 16SWG Th	3 Nos.
7	Copper Contact Pin (Tinned)	40mm L	8mm Rod	12 Nos.
8	Phosphor bronze copper strips (Tinned)	25mm W	100 (0.5 Th)	12 Nos.
9	Spring (Stainless Steel)	18G	25mm Long	12 Nos.
10	Copper Contact (Tinned)	25x5 mm	90mm	6 Nos.
11	Copper Knife (Tinned)	32x5 mm	460mm	3 Nos.
12	Movable Angle	45x45x5mm	400mm	3 Nos.
13	Leading Flat Copper (Tinned)	25x5mm	160mm	3 Nos.
14	Contact Box (Top)	32mm W 8mm H	110mm L 16SWG Th	3 Nos.
15	Movable Arcing Horn	8mm Ø	300mm	3 Nos.
16	Fixed Arcing Horn	8mm Ø	330mm	3 Nos.
17	Horizontal G.I. Pipe B Class	OD 32mm (25NB)	2000mm	1 No.
18	Vertical G.I. Pipe B Class with modified operating flat attachment	OD 32mm (25NB)	5400 mm	1 No.
19	Handle G.I. Pipe B Class	OD 32mm (25NB)	500 mm	1 No.
20	Locking Arrangement	200x75, 100x75 100x75, 280x50	Plates 5mm Th	4 Nos.
21	Bolts & Nut: 80x100mm -24 Nos, 25mm Long -5 Nos. 30mm -18Nos., 32mm Long -60 Nos. Bolts & Nuts are 10mm Ø (M10)			
22	64x12mm – 4 Nos Bolts & Nuts are 10mm Ø (M10)			

Note: 1) For Sl. No 18. Vertical pipe Modified GOS operating flat of size 50x6mm shall be welded as per BESCOM requirement.

2) Above BOM & attached drawing for reference only. Any missing parts shall be included

3) The drawing and BOM approval shall be obtained before Mass production

from QS&S section.

TECHNICAL SPECIFICATION FOR 11KV PEDESTAL POST INSULATORS

1.0 **General Requirements**: The Tenderer shall clearly indicate in the tender, the Brand name of the insulators used in manufacture of GOS along with relevant type test reports failing which the offer will not be considered. The successful bidder shall fix BESCOM approved make 11KV Pedestal Post Insulators.

2.0 Post insulators shall be of stacking type suitable for outdoor use in 11KV system for conductor supports and also for 11KV group operating switches and fuse units mounted in upright inverted orcaotilever position. The post insulators used shall be baked in Temperature controlled kiln only.

3.0 The porcelain shall be sound, free from defects, thoroughly vitrified and smoothly glazed, the glaze on insulators shall be brown in colour and should cover all exposed proporcelain parts except those areas which serve as supports during fixing are required to be left unglazed as detailed in IS:2544-1963.

4.0 Precaution shall be taken during design and manufacture to avoid the following:

a) Stress due to expansion and contraction which may lead to deterioration.

b) Stress concentration due to direct engagement of the porcelain with the metal fittings.

c) Retention of water in recesses of metal fittings and shape which do not facilitate easy cleaning by normal methods.

5.0 All metal parts except those of stainless steel shall be hot dip galvanized after machining zinc coating shall satisfy the requirement of relevant IS specification. The finished galvanized surface shall be smooth.

6.0 The threads of the tapped holes on the post insulator metal fittings shall be cut after galvanizing and shall be protected against rust by greasing or other similar means. All other threads shall be cut before galvanizing.

7.0 The post insulator unit shall be assembled in a suitable jig to ensure the correct positioning of the top and bottom metal fittings relative to one another. The faces of the metal fittings shall be parallel and at right angles to the axis of the insulator and the corresponding holes in the top and bottom metal fitting shall be in vertical plane containing the axis of the insulator.

8.0 The supply of insulators shall include suitable cap screws bolts and nuts and spring washers for stacking. The cap and base shall be malleable cast iron, the surface treatment being hot dip galvanizing.

9.0 **TECHNICAL PARTICULARS**: Individual Units of 11KV stacking units.

Sl.No.	Particulars	Values
1)	Rating	11KV
2a)	Unit description (as per ISS:5350/ Part-III/1971)	E-22 (Except torsion strength as specified)
2b)	Mechanical strength as per Clause 3.2 of IS:5350/ Prt-III/1971.	Strength class 'C' 7.5 to 12KN
3	Highest system voltage	12 KN (rms)
4	Impulse withstand voltage	75 KV (peak)
5 a)	One minute Power frequency withstand Dry	35 KV (rms)
5 b)	One minute Power frequency withstand Wet	35 KV (rms)
6	Power Frequency Puncture withstand voltage (rms)	1.3 times the actual dry flash over voltage of the unit.
7	Visible Discharge test voltage	9 KV (rms)
8	Creepage distance	230 mm
9	Failing load (as per IS:5350 Part-III /1971)	
a)	Upright	9000 N
b)	Under-hung	4500 N
c)	Tension	20000 N
d)	Compression	40000 N
e)	Torsion	680 N.M.
10	Height of insulator (Min)	254mm (Tolerance ±1mm)
11	Insulating part dia (Max)	152 mm
12	Top metal fitting pitch circle dia	57 mm
13	Bottom metal fitting pitch circle dia	57 mm
14	a) No. of bolts	4 Nos.
	b) Bolts holes dia	10 mm tapped holes at the top and 12 mm plain holes at the bottom.
	c) Nominal dia of mounting face not to exceed	85 mm

10.0 **Marking**: Each insulator shall be legibly and indelibly marked with the following.

a) Name or trade mark of the manufacture
b) Month and year of manufacture
c) ISI certificate mark if any
d) Letter BESCOM

Marking shall be durable and shall be printed by the transfer process before firing.

NOTE: Manufacturer's Test Certificate and type test certificate conducted on similar sample insulator shall be submitted for approval before commencement of supplies.

General Manager (Ele),
QS&S, BESCOM